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REMARKS

This is a full and timely response to the final Official Action mailed July 26, 2005.

Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

Claims 23-26 and 35-39 were withdrawn under a previous Restriction Requirement.

Claims 19-21 are cancelled without prejudice or disclaimer in the present paper.

Claim 22 has been amended merely to include the recitations of cancelled claims 19-21, from which claim 22 formerly depended. Therefore, the recitations of claim 22 are unchanged by the present paper, and the amendment to claim 22 does not raise a new issue or require further search or consideration. Moreover, the amendment to claim 22 and the cancellation of claims 19-21 places the application in better form for possible appeal. For at least these reasons, entry of the present paper under 37 C.F.R. §1.116 is proper and requested.

Following entry of the present amendment, claims 1-18, 22, 27-34 and 40-47 are currently pending for further action.

Allowable Subject Matter:

In the outstanding Office Action, the Examiner indicated the presence of allowable subject matter in claims 4 and 13. Applicant wishes to thank the Examiner for this identification of allowable subject matter.

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Prior Art:

With regard to the prior art, claims 1-18, 27-34, 40-47 were rejected under 35 U.S.C. § 103(a) in view of the combined teachings of the article "An Evaluation of Face and Ear Biometrics" by Victor et al. ("Victor") and the article "Human Ear Recognition in 3D" by Bhanu and Chen ("Bhanu"). This rejection is respectfully traversed for at least the following reasons.

Claim 46 recites.

A system for generating an image database comprising:  
a means for generating a three-dimensional image of a subject; and  
a computing device communicatively coupled to said means for generating a three-dimensional image;  
wherein said computing device is configured to receive a three-dimensional image from said means for generating a three-dimensional image and generate multiple two-dimensional images, each two-dimensional image having a varied orientation or illumination condition based on said three-dimensional image.  
(emphasis added).

In contrast, neither Victor nor Bhanu teaches or suggests generating multiple two-dimensional images *based on a three-dimensional image*. Applicant wishes to note that the two-dimensional images claimed are generated *based on a corresponding three-dimensional image*. The final rejection appears to have entirely overlooked this aspect of the claim. The cited prior art fails to teach or suggest the claimed computing device that generates multiple two-dimensional images having a varied orientation or illumination condition *based on a corresponding three-dimensional image*.

The final Office Action argues that "Victor expressly mentions 'the lighting arrangement and positioning of lights, camera..' which 'taken on different days' or different expression." (Action of 7/26/05). This reading of Victor supports Applicant's argument. Victor may teach taking 2D pictures on different days or with different expressions using different arrangement and positioning of lights and camera. This, however, teaches away

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from Applicant's claimed computing device that produces multiple two-dimensional images *based on a corresponding three-dimensional image*. The prior art fails to teach or suggest such subject matter. Moreover, the final Office Action fails to indicate how or where the cited prior art teaches such subject matter.

This argument is further supported by the fact that Victor does not ever mention three-dimensional images and is, therefore, irrelevant to the highlighted feature of claim 46. Bhanu teaches the use of "2D histograms," but histograms are *not* two-dimensional images as claimed. Rather, as explained by Bhanu, a "2D histogram consists of shapes indexes and angles between the normal of reference point and that of its neighbors." (Bhanu, col. 2, first full paragraph). Moreover, only one 2D histogram is generated for each 3D ear representation.

In this regard, the final Office Action cited to Bhanu at Figs. 5 and 6. However, these figures illustrate *different* ears. "The model ears are shown in Figure 5, and the test ears are shown in Figure 6." (Bhanu, sec. 4.1). Thus, these Figures do not teach or suggest multiple two-dimensional images *based on a single corresponding three-dimensional image* as Applicant has claimed.

Consequently, no prior art reference of record teaches or suggests a computing device as recited in claim 46 that generates multiple two-dimensional images, each two-dimensional image having a varied orientation or illumination condition *based on a corresponding three-dimensional image*. "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 46 and 47 should be reconsidered and withdrawn.

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Claim 12 recites:

A method of creating and using a database of ear images for automatic human identification comprising:

generating a three-dimensional image of an ear for each of a number of identified people; and

generating a database comprising a plurality of two-dimensional images based on each said three-dimensional image;

wherein each of said plurality of two-dimensional images represents a varied orientation or illumination condition on said three-dimensional image.

As demonstrated above, neither Victor nor Bhanu teach or suggest a method that involves generating a database of two-dimensional images *based on three-dimensional images* of the ears of identified people as claimed. Again, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 11-18 should be reconsidered and withdrawn.

Independent claim 27 recites

A system for three-dimensional biometric identification comprising:  
a camera system;

a database of images of identified ears, wherein said database of images comprises a three-dimensional image of an ear of each of a plurality of identified subjects and a plurality of two-dimensional images generated from each of said three-dimensional images, wherein each of said two-dimensional images represents a varied orientation or illumination condition on a corresponding three-dimensional image; and

a computing device communicatively coupled to said camera system and to said database of images of identified ears;

wherein said computing device is configured to match an image of a subject's ear acquired by said camera system against said database of images of identified ears to identify said subject.

(emphasis added).

As demonstrated above, neither Victor nor Bhanu teach or suggest a system that involves a database of two-dimensional images "*generated from*" each of a number of three-dimensional images of the ears of identified subjects as claimed in claim 27. Again, "[t]o

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establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). For at least this reason, the rejection of claims 27-34 should be reconsidered and withdrawn.

Claim 1 recites:

A method of automatic human identification, said method comprising matching an image of a subject's ear against a database of images of ears of identified subjects to identify said subject, wherein said database of images comprises a three-dimensional image of an ear of each of a plurality of identified subjects and a plurality of two-dimensional images generated from each of said three-dimensional images, wherein each of said two-dimensional images represents a varied orientation or illumination condition on a corresponding three-dimensional image. (emphasis added).

As demonstrated above, neither Victor nor Bhanu teach or suggest a method that involves a database of two-dimensional images generated from three-dimensional images of the ears of identified subjects as claimed. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claims 1-10 should be reconsidered and withdrawn.

Independent claim 40 recites:

A system for three-dimensional biometric identification comprising: a means for generating a two-dimensional image of a subject's ear; a database of images of identified ears, wherein said database of images comprises a three-dimensional image of an ear of each of a plurality of identified subjects and a plurality of two-dimensional images generated from each of said three-dimensional images, wherein each of said two-dimensional images represents a varied orientation or illumination condition on a corresponding three-dimensional image; and a means for matching said two-dimensional image of a subject's ear against said database of images of identified ears to identify said subject. (emphasis added).

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As demonstrated above, neither Victor nor Bhanu teach or suggest a system for biometric identification that involves a database of two-dimensional images *generated from three-dimensional images* of the ears of identified subjects as claimed. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claims 40-45 should be reconsidered and withdrawn.

Claims 19-22 were rejected as anticipated under 35 U.S.C. § 102(b) by Victor. This rejection is moot as to claims 19-21, which are cancelled herein without prejudice or disclaimer. For at least the following reasons, this rejection is respectfully traversed with respect to claim 22.

Claim 22 recites:

An image matching method comprising performing an Eigen-ears identification method, said method further comprising:  
    performing an Eigen-ear classification procedure on a plurality of two-dimensional ear images; and  
    performing an Eigen-ear recognition procedure on a received two-dimensional ear image,  
    wherein said Eigen-ear classification procedure comprises:  
        computing a weight vector of each of said two dimensional ear images;  
        said plurality of two-dimensional ear images being classified according to said weight vectors; and  
    The method of claim 21, wherein said Eigen-ear recognition procedure comprises:  
        computing a weight vector of said received two-dimensional ear image;  
        and  
        identifying said received two-dimensional ear image as belonging to a class if one of said weight vectors minimizes a Euclidean distance to said weight vector of said two-dimensional ear image below a threshold value.  
(emphasis added).

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In contrast, Victor fails to teach or suggest the claimed method including "identifying said received two-dimensional ear image as belonging to a class if one of said weight vectors minimizes a Euclidean distance to said weight vector of said two-dimensional ear image below a threshold value."

"A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least this reason, the rejection of claim 22 should be reconsidered and withdrawn.

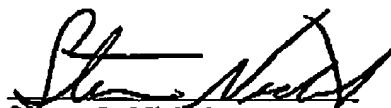
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Conclusion:

If any fees are owed in connection with this paper, which have not been elsewhere authorized, authorization is hereby given to charge those fees to Deposit Account 18-0013 in the name of Rader, Fishman & Grauer PLLC. If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,



Steven L. Nichols  
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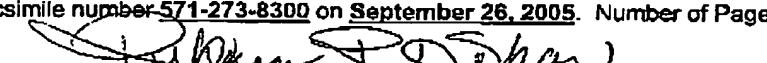
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I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number 571-273-8300 on September 26, 2005. Number of Pages: 22

  
Rebecca R. Schow